

- [C001]** A thermistor probe assembly, comprising:
- a thermistor element; and
  - a positioning device for positioning the thermistor element at a pre-determined location within the assembly.
- [C002]** The assembly of claim 1, wherein the thermistor element has a cross-sectional profile selected from the group consisting of a square-shaped profile and a circular-shaped profile.
- [C003]** The assembly of claim 1, wherein the thermistor element comprises a ceramic material.
- [C004]** The assembly of claim 1, wherein the positioning device comprises one or more materials selected from the group consisting of polyvinyl chloride and polybutylene terephthalate.
- [C005]** The assembly of claim 1, wherein the pre-determined location is at a central location within the thermistor probe assembly.
- [C006]** The assembly of claim 1, further comprising at least two lead wires extending from the thermistor element.
- [C007]** The assembly of claim 6, further comprising a conductor material coupled to the thermistor element through the at least two lead wires.
- [C008]** The assembly of claim 7, wherein the conductor material comprises brass.
- [C009]** The assembly of claim 7, further comprising an insulating material disposed over the conductor material.
- [C010]** The assembly of claim 7, further comprising a moisture proof shield disposed to cover the thermistor element and the positioning device.
- [C011]** The assembly of claim 10, wherein the moisture proof shield comprises a surface energy enhancing material disposed over the conductor material.

**[C012]** The assembly of claim 11, wherein the surface energy enhancing material comprises a material selected from the group consisting of Loctite P 770, Loctite P 7452, Loctite P 34589, and P cyclohexane.

**[C013]** The assembly of claim 10, wherein the moisture proof shield comprises a molding material disposed over the thermistor element and the positioning device.

**[C014]** The assembly of claim 13, further comprising an insulating material disposed over the conductor material, wherein the molding material disposed over the thermistor element and the positioning device is compatible with the insulating material disposed over the conductor material.

**[C015]** The assembly of claim 6, wherein the lead wires are soldered to the conductor material.

**[C016]** The assembly of claim 6, wherein the lead wires are spot-welded to the conductor material.

**[C017]** The assembly of claim 6, wherein the lead wires comprise steel.

**[C018]** The assembly of claim 6, wherein the lead wires comprise copper.

**[C019]** A positioning device for centering a thermistor element within a thermistor probe assembly, wherein the positioning device comprises:

a cavity extending therethrough and adapted for receiving a thermistor element;

at least three self-centering lobes adapted to position the thermistor element within the thermistor probe assembly; and

a relief groove positioned between two of the at least three self-centering lobes.

**[C020]** The device of claim 19, wherein the relief groove is configured to adjust a dimension of the cavity.

**[C021]** The device of claim 19, wherein the relief groove is configured to provide a path for filling the cavity with a material.

**[C022]** A method for positioning a thermistor element inside a thermistor probe assembly, comprising:

inserting a thermistor element through a cavity extending through a positioning device; and

disposing a moisture proof shield over the thermistor element and the positioning device, wherein the positioning device comprises:

at least three self-centering lobes adapted to position the positioning device inside the moisture proof shield; and

a relief groove positioned between two of the at least three self-centering lobes.

**[C023]** The method of claim 22, wherein the inserting step comprises adjusting the relief groove to increase a dimension of the cavity.

**[C024]** The method of claim 22, wherein the inserting step comprises adjusting the relief groove to decrease a dimension of the cavity.

**[C025]** A method for manufacturing a thermistor probe assembly, comprising:

inserting a thermistor element coupled to a conductor material through a cavity in a positioning device, the positioning device comprising:

a cavity extending through the positioning device;

at least three self-centering lobes; and

a relief groove positioned between two of the at least three self-centering lobes;

disposing an insulating material over the conductor material;

providing a surface energy enhancing material coating over the conductor material; and

molding a material over the thermistor element and the positioning device using a single stage molding process.

[C026] The method of claim 25, wherein the positioning device is formed by molding using a single stage molding process.

[C027] The method of claim 25, wherein the inserting step comprises adjusting the relief groove to increase a dimension of the cavity through the relief groove.

[C028] The method of claim 25, wherein the inserting step comprises adjusting the relief groove to decrease a dimension of the cavity through the relief groove.

[C029] The method of claim 25, wherein the molding step comprises disposing a material over the thermistor element and the positioning device through a runner and a gate placed at a pre-set location.

[C030] The method of claim 29, wherein the material is compatible with the insulating material disposed over the conductor material.

[C031] The method of claim 29, wherein the pre-set location is downstream of the positioning device.